

Paria Canyon -- Vermillion Cliffs
Survey Results for Wilderness Managers

Parker Research Consultants

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PARIA CANYON -- VERMILLION CLIFFS
Survey Results for Wilderness Managers
April 1992

P A R K E R R E S E A R C H C O N S U L T A N T S

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MANAGEMENT ANALYSIS: PARIA CANYON WILDERNESS

INTRODUCTION

The Paria Canyon - Vermillion Cliffs Wilderness area is a designated wilderness area administered by the Bureau of Land Management. The Paria Canyon - Vermillion Cliffs Wilderness (hereafter referred to as the PC-VCW) was declared an official wilderness area in 1969 when 27,515 acres were set aside in Utah and Arizona to comprise the Paria Canyon Primitive Area.

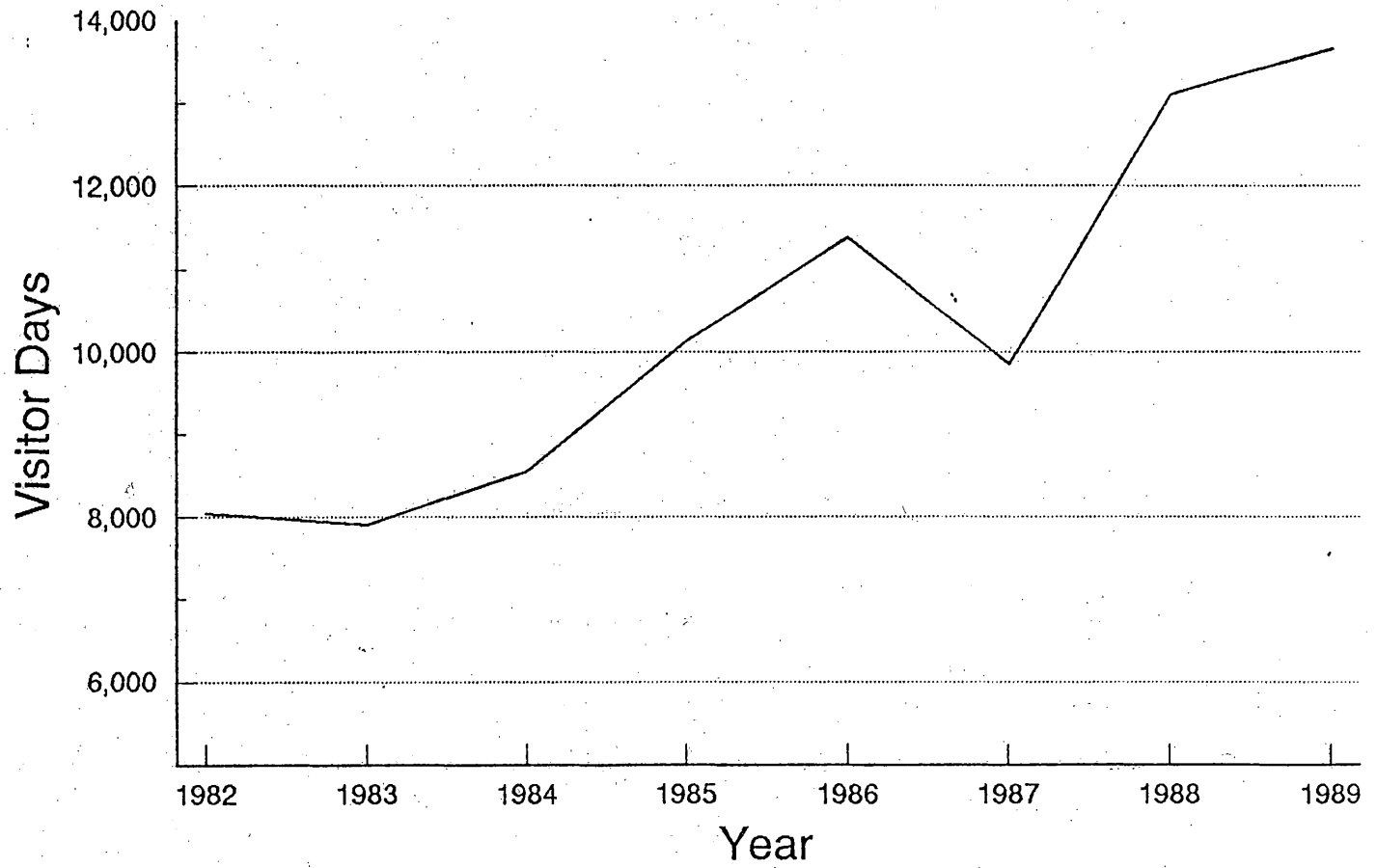
The Paria Canyon Primitive Area has become a nationally significant recreation area, well known for its backcountry values and isolated hiking experiences. Since a 1978 "Arizona Highways" article on the Paria Canyon, use levels have increased dramatically and user profiles indicate use by many foreign as well as American hikers.

PROBLEM STATEMENT

Visitation to the PC-VCW increased after the appearance of the 1978 article in "Arizona Highways" and the Sierra Clubs's subsequent listing of the PC-VCW as a wilderness area of special note in their South West trail guide. Use of the canyon for backpacking has increased from 4,977 visitor days in 1971 (the first year records were kept) to a peak visitation in 1978 of 11,528 visitor days. Usage levels declined from the 1978 high use plateau, but have been steadily climbing back to just over 10,000 visitor days in 1985. By 1989, visitation had increased to 13,667 visitor days with only 1987 representing a significant drop in visitor days (see Figure 1). Problems generated by such high use levels are further exacerbated by the fact that most use is concentrated between the months

of April and June before the onset of hot weather.

Figure 1. Paria Canyon Vermillion Cliffs Annual Visitation.



Group size has been currently limited to 15 individuals per party. The group size restrictions have been instituted due to a lack of available campsites at the point where most hikers stop for their first night. Large groups using these limited campsites on the first night have caused in the displacement of smaller groups and site deterioration due to overcrowding. The group size regulation, while an official management policy, has not been strictly enforced due to lack of manpower, etc. This overcrowding has resulted in deterioration of or reduction in visitors' expectations of achieving a wilderness experience.

The potential for diminished expectations by wilderness users due to overuse combined with campsite deterioration lead the Bureau of Land Management (BLM) to commission a study on management problems and solutions for the PC-VCW. The management agency (BLM) is interested in finding out the backcountry users' attitudes concerning specified problems and their perceptions of appropriate management solutions. This information will aid the management agency in determining appropriate management techniques to control problems in the PC-VCW area.

METHODOLOGY

Questionnaire Design

To assess the impact of overcrowding and users' ability to experience a wilderness experience within the PC-VCW, a questionnaire was developed jointly by the BLM resource management, recreation personnel and the Arizona Hospitality Research and Resource Center (AHRRC) at Northern Arizona University. The questionnaire was designed to gather information on backcountry users, their party size, activities within the canyon, and problems encountered within the canyon, as well as their views on appropriate management techniques.

The survey instrument also contained questions on respondents' perceptions of the canyon, their feelings of attachment to the canyon and the Colorado Plateau, as well as their past use of the PC-VCW. Respondents were also asked whether they would change the dates or seasons of future trips. The questionnaire concluded with requests for standard demographic data that would be useful for projecting a user profile for PC-VCW. The questionnaire is included in Appendix A at the back of this report.

A random sample of 850 users was drawn from the 1989 season: names and addresses were obtained from use permits backcountry users are required to fill out before entering the wilderness area.

Response Rate

The questionnaires were mailed out in mid-December'; completed returns started arriving by the 1st week of January. The response rate after a single mail-out

was 342 usable responses, which provided the study with a response rate of 40.23 percent. Questionnaires were no longer accepted for analysis after 45 days of the initial mailing date. Questionnaires received after the 45 day cut-off were added to the data file but excluded from analysis.

A response rate of 40.23 percent while not high is quite acceptable when compared to 30 percent response rates which are considered acceptable for a one time mail-out questionnaire with no follow-up. Of the non-respondents, 94 (or 11.5 percent) of the questionnaires were undeliverable due to incomplete addresses, or respondents having moved without leaving a forwarding address.

Analysis

Respondents were grouped into those who displayed a high level of place attachment and those who displayed a low level of place attachment to the Paria Canyon area. The degree of place attachment to the canyon shown by the respondents was used as the dependent variable to measure the problems and the appropriate management techniques.

The logic behind the use of place attachment as a conceptual framework to provide a measure of the importance of problems, and appropriate management techniques comes from social psychology and place identity theory. Proshanskey et al. describe place attachment in the following terms: "...through personal attachment to geographically locatable places, a person acquires a sense of belonging and purpose which gives meaning to his or her life.." Simply put, those respondents who evidence a high degree of attachment to the canyon would tend to view use problems and management alternatives differently than those who are not so

strongly attached. This provides managers and planners with two differing perspectives to use in determining acceptable management criteria for wilderness areas. Place attachment theory also dovetails with the limits of acceptable change models as a means of allocating resources or determining change levels in natural environments.

The analysis procedure used in the study consisted of developing a measure of place attachment by collapsing variables that measured place attachment in the user perception questions. A *Pearsons R correlation coefficient* was run to test the positive correlation between place attachment questions and the measure of place attachment. All place attachment scales were correlated at the point .001 level of significance by the *Pearsons R* test.

The upper and lower quartiles (25%) of the sample were retained for future analysis. The reasoning behind the use of quartiles is that those respondents who fell into the upper and lower 25 percent of the sample would best describe two distinct management groups. The upper quartile are those who may be classified as users with high wilderness expectations while those in the lower quartile do not have such high wilderness expectations. Thus the management agency now has the opportunity to determine appropriate management techniques based upon expected levels of wilderness experience and expectations.

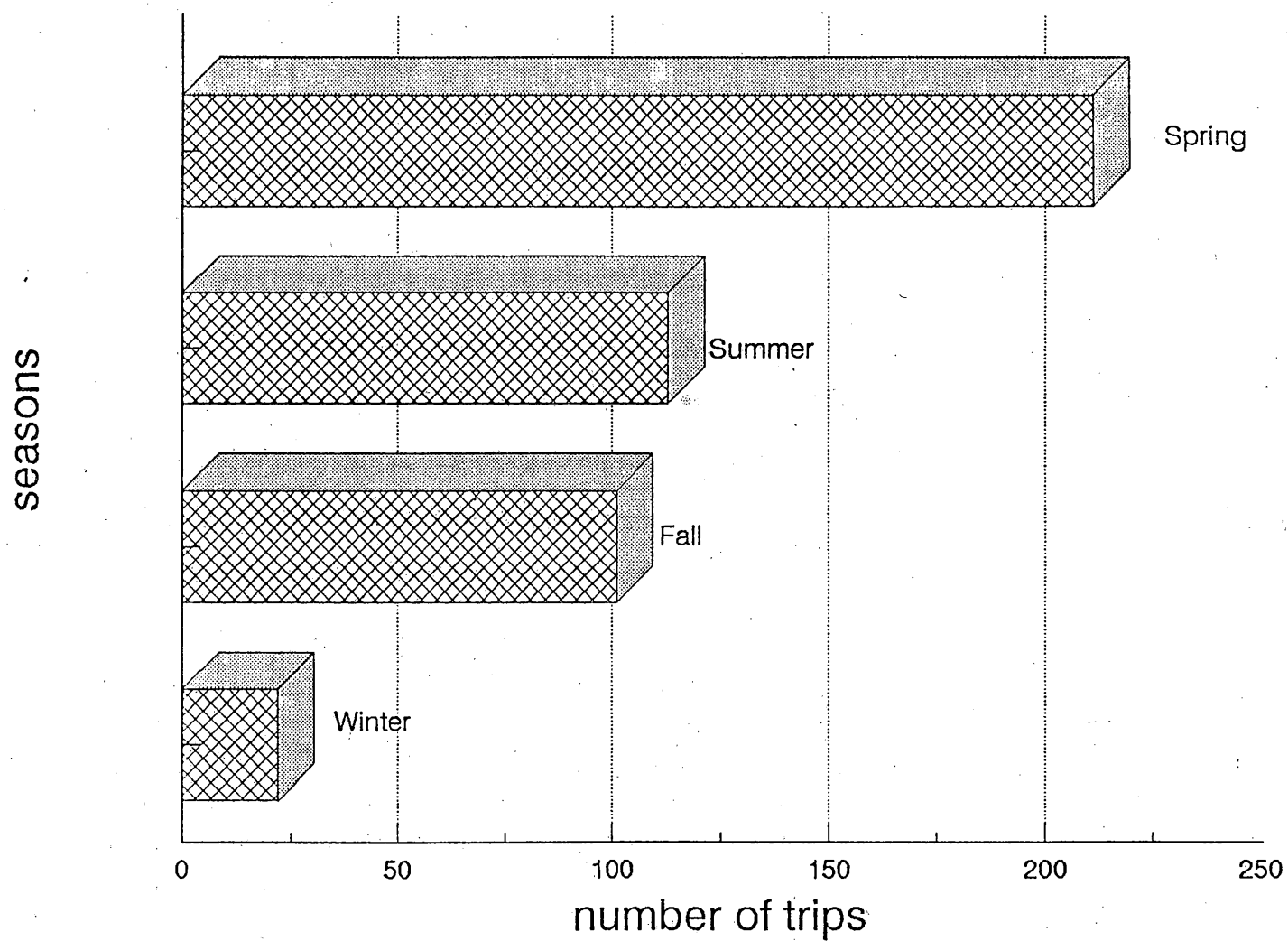
The remainder of this report will consider management problems identified by respondents and the management techniques that may be employed to control these problems. Analysis will take the form of a description of the problem and how both the high and low place attachment groups regarded this problem. Appropriate management actions to counteract the problem will be discussed in tandem with the problem itself to provide a basis for comparison.

Demographics of Respondent Sample

A review of the respondents' demographic characteristics will provide the management agency with a yardstick by which to compare the sample of respondents with past user profiles. The mean age of respondents who hiked the canyon was 38 years old with the mode being 33 years of age. The oldest respondent to provide this/her age was 76 years old. It is interesting to note that nearly 7 percent of the respondents to the questionnaire fell between the ages of 60 and 76 years old. The bulk of the respondents (60.5%) ages fell between 21 and 50 years of age. The gender of the sample was predominantly male, with 73.4 percent of the sample being male. The median educational level of the respondents to the questionnaire was a four year college degree with a significant 16.1 percent of the sample holding graduate and professional degrees. The average length of time between the present and last visit to the canyon ranged between one and five years for a majority of the sample (40.3%).

Respondents were asked whether they would change their trip times or days as a result of problems in the canyon. Only 26.3 percent of the sample indicated that they had changed their trip time as a result of problems experienced in the canyon. The most popular hiking period for respondents appears to be the spring, followed by summer and fall with the least popular time to hike being the winter. Many respondents had taken multiple trips over two of the seasons. Seasonality of trips (excluding multiple trips) is illustrated in Figure 2 on the following page.

Figure 2. Seasonality of trips to Paria canyon.



PROBLEM IDENTIFICATION AND MANAGEMENT SOLUTIONS

Question 10 in the questionnaire (see Appendix A) asked the respondents to rate various problems on a 5 point Likert scale where the response to the identified problem could range from "not a problem" to a "very serious problem". In a like manner, question 11 asked the respondents how they felt about certain potential management solutions to enhance the PC-VCW wilderness. A six point Likert scale was again used where the respondents were asked how much in favor they were of a specific management solution. The scale ran from "very much in favor" to "very much against" with a category for no opinion/not applicable.

To reduce the number of management techniques and problems under consideration to a manageable number, a factor analysis was used to reduce the large number of alternatives to a usable amount. The factor analysis also helped to point out commonalities among management practices and identified problems. Both sets of variables yielded 5 factor solutions for management issues and identified problems. The broad problem areas factored for question 11 identified by respondents were: 1) Litter and toilets, 2) Presence of cattle in canyon, 3) Resource degradation, 4) Campsite degradation and competition, and 5) Appropriate behavior in wilderness. The management solutions factored for question 12 were; 1) Management of people, 2) Management of information, 3) Management by rules and regulations, 4) Management by use of developed campsites, and 5) Management by removal of cattle. These are broad areas of identified problems and potential management solutions for the PC-VCW and as such, help to point the way to possible management strategies.

LITTER AND TOILET DISPOSAL

Litter in Canyon and at Campsites

Increased use of the PC-VCW has lead to noticeable physical impacts on the canyon environment. One of the most noticeable indicators of increased use is that of litter at campsites, and, to a lesser degree, in the canyon itself. Of those respondents with a low sense of place attachment, 50.0 percent of the sample felt that litter in the canyon was a problem. Of this 50.0 percent, only 26.3 percent identified the problem of litter as being "a serious or very serious problem." Of those respondents with a high sense of place attachment, 55.0 percent identified litter in the canyon as a problem. Of the 55.0 percent, only 15.0 percent identified the problem of litter in the canyon as "being a serious or very serious problem." The problem of litter in the canyon was identified as "a moderately serious" to "very serious" problem by 14.1 percent of the total sample. Although 28.5 percent of the sample identified litter in the canyon as a slight problem, when these responses are combined with the 14.1 percent who saw the problem of litter in the canyon as "serious", they represent 42.6 percent of the total sample. There was, however, no significant difference between the responses of those visitors who were classified as having a low sense of place attachment and those with a sense of high place attachment.

Opinions were less divided as to whether litter at campsites was as much of a problem as was the case of litter in the canyon. Of those respondents with a low sense of place attachment, 62.2 percent rated litter at campsites a "slight" to "serious" problem, while those respondents with a high sense of place attachment (73.7%) rated litter at campsites a "slight" to "serious" problem. In the overall sample of respondents, 56.3 percent rated litter at campsites to

be a "slight" to "serious" problem. A Student's t statistics revealed that there was a significant difference in the way that low and high place attachment visitors rated the seriousness of litter at campsites; this difference was significant at the .01 level. The greater stress placed by respondents on litter at campsites may be attributable to the congested conditions and concentrated high use in the camping areas.

In determining the percentage of allowable litter in the canyon or at campsites, it should be kept in mind that a wilderness area, by definition, is a place that does not show signs of man. If this description is to be adhered to, the allowable level of litter should be nil. Reality dictates that heavy use will result in some level of littering, but visitor perceptions of what level of litter is acceptable may not be consistent with acceptable wilderness standards. (Please see Table 1 on the following page).

Table 1. Litter as a problem Paria canyon and at campsites

QUESTION	LOW PLACE ATTACHMENT % RESPONSE	HIGH PLACE ATTACHMENT % RESPONSE	TOTAL POPULATION % RESPONSE
Litter in canyon	26.3	55.0	42.6
Litter at campsites	62.2	73.7**	56.3

** Significant at the .01 level

Management Options for Litter Control

No potential management options pertaining to the control of litter in the canyon or at the campsites were put forward in the questionnaire. Since a possible cause of littering may be the lack of general knowledge about the wilderness ethic and the need to preserve the environment in a pristine state, education may prove to be the most cost efficient and appropriate method of controlling litter in the canyon and at campsites. Disposal methods for litter in wilderness areas are well established. The most common method, in areas where fire is allowed, is to burn litter or garbage that is burnable and to pack out that which is unburnable. This method is considered by most management agencies as the most acceptable method of garbage control. An less acceptable alternative is the use of garbage pits. Garbage pits, however, are purely a visitor convenience (and an improvement only over outright littering). At the same time, they also impose a substantial adverse impact on the wilderness.

Toilets and Waste Disposal

Increased use in peak seasons has resulted in a substantial strain being placed on the disposal of human waste in the canyon. The limited availability of campsites in the areas used for stopovers on the first two nights has resulted in the congestion of visitors in a relatively small area. Since there are no toilet facilities in the wilderness except at trailheads another noticeable indicator of increased use in the canyon has been the evidence of toilet paper and the encroachment of toilet sites on the campsites. A number of questions were asked that attempted to gauge how much of a problem waste disposal and the disposal of waste residues was in the canyon. The following paragraphs consider the problem of waste disposal as well as appropriate management options in the light of respondents' answers.

There was little difference between those respondents who exhibited high or low place attachment with regard to the evidence of toilet paper at the campsites. Of those respondents with a low sense of place attachment, 50.0 percent of the sample felt that toilet paper evidence at campsites was a "slight" to "serious problem", while 47.4 percent of respondents who had a high sense of place attachment regarded toilet paper as a problem at campsites. An interesting observation though, was the fact that only persons in the low place attachment group felt that toilet paper at campsites was a "very serious problem".

Approximately a half of the sample did not consider toilet paper to be a problem at campsites. This may be the result of those respondents who noticed the toilet paper using the campsites during periods of peak use. This result appears to be consistent, as approximately half of the sample (49.2%) felt that toilet paper at the campsites was a problem.

Respondents were asked whether toilet sites were noticeable and if this was considered to be a problem. A slim majority of both sets of respondents felt that toilet sites were noticeable and that this was a problem. Those with a strong sense of place attachment (63.2%) felt that it was more of a problem than those respondents falling into the low place attachment category (54.3%). Of the total sample of respondents, only 49.4 percent felt that it was a problem; this in turn, may simply be representative of the difference in perceived wilderness levels between those respondents who exhibit a high level of place attachment and the remainder of the sample.

Respondents were also asked whether the encroachment of toilet sites on the campsites was a problem. Half the sample (50.0%) of respondents with a low sense of place attachment felt that toilet sites encroaching on the campsites were a problem; whereas, 63.2 percent of the sample with a high sense of place attachment rated toilet sites encroaching on campsites as a problem. A Student's t statistic revealed that there was a significant difference between the way that high and low place attachment groups viewed the issue of toilet site encroachment on campsites; the difference was significant at the .05 level. When compared with the total sample, only 49.4 percent of those respondents considered encroachment by toilet sites to be a problem and only 10.8 percent of the sample rated the problem as "serious" or "very serious." This may be indicative of a coping mechanism among users in the canyon where the expectations of crowds are accepted and the attendant problems such as waste, etc., expected. (Please see Table 2 on the following page).

Table 2. Toilets and waste disposal as a problem in Paria canyon

QUESTION	LOW PLACE ATTACHMENT % PROBLEM	HIGH PLACE ATTACHMENT % PROBLEM	TOTAL POPULATION % PROBLEM
Toilet paper at campsites	50.0	47.4	49.2
Noticeability of toilet site	54.3	63.2	49.4
Toilet sites encroaching on campsite	50.0	63.2*	49.4

* Significant at .05 level

Management Actions Re Toilets and Waste Disposal

Respondents were asked to respond to certain management alternatives relating to the problems they experienced while in the PC-VCW. Once more, the response of those visitors with a low sense of place attachment will be compared to those visitors with a high sense of place attachment.

Visitors fitting the low place attachment profile appear to be against having toilets at the campsites. Of the respondents 42.5 percent were "very much" or "somewhat opposed" to toilets at campsites whereas 22.5 percent of respondents were "somewhat" or "very much in favor" of toilets at campsites. It should be noted, however, that 30.0 percent of the respondents in this category selected the category of "it depends." There is no statistical basis for inferring the

potential decisions for those respondents who answered in this way. The potential may exists for these respondents to vote for or against toilets at campsites if further information on the subject were made available to them.

Those visitors fitting the high sense of place attachment profile also appeared to be opposed to toilets in the canyon. Those respondents who were "very" to "somewhat" against toilets in the wilderness comprised 50.0 percent of the sample. However, those who were "in favor of" toilets comprised only 35.0 percent of the sample. Those respondents who were neutral comprised only 10.0 percent of the sample and were not as noticeable as the neutral respondents in the low place attachment group. When considered as a unit, the total population appears to be narrowly opposed (48.3%) to the use of toilets in the canyon. Those in favor of toilets comprise a slim 28.2 percent while 19.6 percent of the sample feel that a decision may depend on certain other unstated factors. The population mean for the sample was 2.502, which places the majority of the respondents as being opposed to toilets in the canyon.

Respondents were generally in favor of placing more restrictions on the disposal of human waste in the canyon. Respondents with a low sense of place attachment were generally in favor of restrictions on human waste disposal. Of those respondents, 50.0 percent were "somewhat" to "very much" in favor of restrictions while 25.0 percent were "opposed" to restrictions. Those who felt that the situation dictated whether there was a need for restriction accounted for 17.5 percent of the sample. Respondents with a strong sense of place attachment were the strongest of the two groups in their approval of restrictions on the disposal of human waste in the canyon. The sample was 70.0 percent "somewhat" to "very much" in favor of restrictions, with 20.0 percent being "opposed" and 5.0 percent feeling that the response depended on the situation. When the sample is

considered as a whole, 53.7 percent of the visitors are in favor of restrictions on the disposal of human waste in the canyon whereas only 16.6 percent are "opposed" to restriction of any sort. A significant 22.8 percent of the sample indicated that restrictions on the disposal of human waste would depend on the situation.

Both groups agreed unanimously on the option which provided for more information on the disposal of human waste as a potential management action. Those visitors who wanted more information on human waste disposal were in the majority (51.3 %) amongst the group with a low sense of place attachment. On the other hand, only 2.6 percent of the sample was "opposed" and 15.4 percent felt that the need for further information would depend upon the situation.

In comparison, those respondents who fit into the strong sense of place attachment category were overwhelmingly (76.5%) in favor of more information on human waste disposal. Only 5.9 percent of the sample were "opposed" to more information while those respondents who felt that the situation would dictate the need for the management policy accounted for 11.8 percent of the sample. When the whole sample is considered, an overwhelming 77.9 percent are "somewhat" to "very much" in favor of receiving more information on human waste disposal in the canyon. An insignificant minority of 3.8 percent was "not in favor" of receiving more information, while 10.2 percent of the sample felt that the need for more information would depend upon the situation. The sample mean was 4.000, which indicates that the majority of the sample was in favor of receiving more information on waste disposal in the canyon. A Student's t statistic showed that there was a significant difference between the way low place and high place attachment groups considered the need for information on waste disposal. The Student's t statistic is significant at the .01 level. (See Table 3 below)

Table 3. Management alternatives for human waste disposal in the canyon.

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPULATION MEAN
Toilets at campsites	22.5	35.0	28.2	2.502
More information on disposal of human waste	74.3	76.5**	77.9	4.000
More restrictions on disposal of human waste	50.0	70.0	53.7	3.340

** Significant at the .01 level.

CAMPSITE COMPETITION AND DEGRADATION

Campsite Degradation

Resource degradation is possibly most noticeable in the canyon at campsites. Increasing popularity of the canyon as a pristine wilderness has been complicated by the limited availability of campsites for the first two nights in the canyon. Increased use has lead to crowding and competition for prime camping sites on the sandy beaches and river terraces. Overcrowding and campsite degradation are directly correlated to high use periods and party size which have resulted in overcrowding and attendant competition as well as resource degradation. An increase in vandalism has been noted in the canyon, especially at campsites. Vandalism, while not directly a camp-related issue, will be discussed in tandem with campsite competition and degradation issues.

Visitors with both a strong and low sense of place attachment noticed signs of overuse at the campsites and felt that it was a "slight" to "serious problem". A narrow majority (51.4%) of visitors with a low sense of place attachment felt that signs of overuse at campsites were "noticeable" and were a problem. Whereas, 78.9 percent of the high sense of place attachment sample considered it to be a "slight" to "moderate" problem. Overall, a slim minority (56.6 percent) of the entire sample rated signs of overuse at campsites as a problem. The population mean for the sample was 4.075, which identifies a majority of the respondents as viewing signs of overuse at the campsites as problematic. A Students t test showed that there was a significant difference at the .01 level of significance between low and high place attached respondents with respect to how they viewed the problem of overuse at the campsites.

As mentioned in the previous section, the availability of campsites, in some

instances, is strictly curtailed by limiting factors of environment. This is specifically the case on the first two nights in the canyon and in some other spots within the canyon such as Buckskin Gulch and the lower terraces. Neither low nor high place attachment groups considered the availability of campsites due to limiting environmental conditions to be a problem. Of those respondents with a low sense of place attachment, only 44.4 percent of the visitors felt that a limited number of campsites resulting from environmental conditions was a problem. A majority of 55.6 percent of low place attachment respondents did not feel that this was a problem. Only 50.0 percent of respondents in the high place attachment category felt that limited campsites due to environmental conditions were a problem. When considering the overall population, a little over half the sample (59.9%) considered limited campsites due to environmental conditions to be a problem. The population mean for the question was 4.335, which indicates that the majority of the respondents view limiting environmental conditions as a "slight" problem. The lack of consensus attached to the environment as a limiting factor may relate to an awareness of the fact that in a canyon, there are only a certain number of prime campsites available.

Data from both sets of respondents was once again inconclusive regarding their perception of a problem of campsite availability due to competition with other visitors in the canyon. Those respondents exhibiting a low sense of place attachment who considered competition with other users to be a significant problem accounted for an extremely narrow majority of 51.4 percent. Only 42.1 percent of respondents who fell into the high place attachment group considered competition for sites to be a problem. The difference in opinion may be the result of the times that the various groups traveled i.e., low or high intensity of visitation, party size, and prior perceptions of a wilderness experience. As has been pointed out in a previous discussion, the intensity of use during peak

periods has lead to the diminishing of potential wilderness experiences in the canyon. If this is the case, visitors may have already considered the possibility of competition as well as other limiting factors and have accepted the inevitability of a diminished experience. Therefore, it may be quite possible that respondents with diminished expectations do not perceive crowding and competition as "serious problem"s, as they are in some way pre-conditioned for them.

Visitors to the canyon were asked to what extent they perceived vandalism to be a problem in the canyon. The potential for vandalism has increased along with the greater intensity of use during peak periods. The BLM classifies vandalism in the canyon in two basic ways. These are: vandalism to natural resources; writing names on rocks, blazing trees, etc., and vandalism to cultural resources; damaging petroglyphs, writing on or removing historic building masonry, etc. Respondents with a low sense of place attachment did not consider vandalism to be a problem at campsites or in the canyon. Only 31.4 percent of those respondents felt that it was a "slight" to "serious problem". On the other hand, 45.0 percent of the high place attachment group considered vandalism to be a problem.

Neither of these groups are in the majority as to their perception of the vandalism issue as a problem. It should be noted, however, that there was a significant difference in the way the place attached groups viewed the problem of vandalism. High place attached groups tend to view natural resources in a specific way that tends towards preservation rather than destruction and, therefore, tend to have strong feelings about vandalism issues. The difference between the two groups was significant at the .05 level. The general consensus of the sample was that vandalism was not a "serious problem" in the canyon. This

is further exhibited by the fact that only 27.3 percent of sample population considered vandalism to be a problem in the canyon and at campsites.

The evidence of fire rings at campsites is another telltale sign of the overuse of campsites and a potential negative environmental impact on the canyon resulting from visitation and use. In some cases, evidence of fire rings is considered by managers of wilderness areas to be an undesirable mark of man which detracts from the quality of the wilderness experience. The major use of fires in the canyon would appear to be social rather than culinary. Campfires have a long tradition in the outdoors and the banning of such social fires may prove to be an ineffective management tool. In some cases fire rings may serve as an attraction factor in that parties are attracted to existing fire rings. This repeat use of a specific site in turn increases the environmental impact on the campsite and leads to conditions of site degradation, etc. Although exactly half of the respondents (50.0 %) with a low sense of place attachment considered evidence of fire rings to be a problem, 68.4 percent of those respondents with a strong sense of place attachment felt that fire rings were a problem. The Student's t statistic revealed that there was a significant difference (at the .01 level) between how visitors with a low sense of place attachment and those with a high sense of place attachment viewed the problem of existing fire rings. A small majority (56.2%) of the sample population considered fire rings at campsites to be a problem. The population mean for the sample was 4.040, indicating that the overall sample considered fire rings to be a "slight" problem.

The physical impact of other visitors is best discussed in relation to campsite degradation. The potential for hikers to notice the physical presence of others and to perceive an impact from these other visitors is greatest at campsites.

Both high and low place attached groups felt that the physical impacts of other groups or parties were a "serious problem". The degree to which the problem is considered severe may have a potential correlation to the desired wilderness experience as well as prior wilderness experiences and knowledge. Both high and low place attached groups saw the physical impact of other groups as a problem. It was, however, the group with a strong sense of place attachment (85.0%) who perceived the physical impact of other groups as the greatest problem. A strong majority (67.7%) of the low place attachment group also considered the physical impacts of other groups to be a problem as well.

There was a significant difference between the two place attachment groups in terms of how they viewed the physical impacts of other visitors. This may be indicative of the difference in the wilderness experience desired by the visitors. Those with a high place attachment may possibly tend to have higher wilderness experience expectations and therefore notice the impact of other visitors more readily. The difference between the two groups was significant at the .05 level of significance. When considering the overall sample, a solid majority of 61.2 percent of the respondents regarded the physical impact of other groups to be a problem. The sample mean was 3.985, which indicates that the overall sample population regards the impact of other visitors as a "moderate" to "slight problem." (Please see Table 4 on the following page)

Table 4. Campsite competition and degradation problems

QUESTION	LOW PLACE ATTACHMENT % RESPONSE A PROBLEM	HIGH PLACE ATTACHMENT % RESPONSE A PROBLEM	TOTAL POPULATION % RESPONSE A PROBLEM	POPULATION MEAN PROBLEM
Vandalism	31.4	45.0*	27.3	4.575
Signs of overuse at campsites	51.4	78.9**	56.6	4.075
Availability of campsites due to limiting environmental conditions	44.4	50.0	59.9	4.335
Availability of campsites due to competition with other visitors	51.4	42.1	42.3	4.292
Evidence of fire rings at campsites	50.0	68.4**	56.2	4.040
Physical impact of other visitors	67.6	85.0*	61.2	3.985

* Significant at the .05 level

** Significant at the .01 level

Management Actions to Combat Campsite Degradation and Competition

Evidence of Fire

A narrow majority of respondents (58.5%) were in favor of the management option of allowing no open fires in the canyon. Respondents with a high sense of place attachment were more forceful in their desire to exclude open fires from the

canyon, with 63.2 percent being in favor. Of those in favor, 82.5 percent of the sample were "very much" in favor of excluding open fires from the canyon. In both groups those respondents who felt that management techniques depended on the situation accounted for less than 10 percent of the sample. When the total sample is considered, 56.3 percent are in favor of banning open fires in the canyon, with 83.2 percent of the sample being "very much" in favor excluding open fires from the canyon as a management practice.

There is little consensus between both low and high place attached groups as to whether firepans should be allowed in the canyon. The low place attachment group did not appear to be overly enthusiastic about the use of firepans, as a small 27.5 percent of the sample was in favor of this technique. However, 42.5 percent of the sample was "somewhat" to "very much" against the use of firepans at all. The remainder of the sample was split between 15.0 percent who felt that the use of firepans depended upon the situation and 15.0 percent who had no opinion or felt that the management technique did not apply to the situation in the canyon. Respondents with a high sense of place attachment were also unanimously "opposed" to the use of firepans with only a minority of 15.0 percent of the sample being in favor of their use. Those "opposed" to firepans comprised 40.0 percent of the sample, while 25 percent of the sample, felt that use of firepans depended upon the situation. The remaining 20.0 percent of the sample had either no opinion or felt that the management technique was not applicable to the canyon.

When the sample population was studied, only 27.9 percent were in favor of the use of firepans in the canyon, though 40.5 percent "opposed" their use. The population mean is 2.313, which indicates that the sample is generally "opposed" to the use of firepans in the canyon. Although, some wilderness areas have permanent fireplaces, especially in areas of high fire hazard, this is not the

case of the PC-VCW where the fire hazard is relatively low. Permanent fireplaces in this situation are not a compelling alternative and should be avoided.

Firepans are generally used along wilderness rivers but, these often prove cumbersome to carry and troublesome since debris from firepans must be either scattered, sunk, or dispersed by water. Both firepan dispersal methods, if not used carefully, may result in a greater aggregate environmental impact than a few well located "permanent" fire rings which would generally spread out the impacts. Most backpackers and visitors to the wilderness now use backpacker stoves, which eliminate the need to cook over an open fire. If fires are left to burn out before being drowned ashes and partially burned wood are reduced, the impact is minimized as contrasted to large thoughtlessly handled fires which leave unburned wood. Behaviors based upon the wilderness ethic and good outdoor skills are the keys to the proper handling of fire issues. (See Table 5 below).

Table 5. Management alternatives for use of fire in canyon

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPULATION MEAN
Firepans allowed in the canyon	27.5	15.0	27.9	2.313
No open fires allowed in the canyon	56.1	63.2	57.3	3.456

Campsite Degradation and Competition

Where actual campsite management practices were being considered, there were only two questions that described physical management practices. A number of questions attempted to gauge the respondents' perceptions about party size and other restrictions, but did not focus on the managerial aspects of campsite maintenance, etc. The following discussion will consider only those questions related to campsite preservation.

One alternative management practice designed to preserve the quality of the campsites and to slow down the process of environmental degradation is that of closing down a campsite to allow for recovery. Both low and high place attachment groups are in favor of this management practice. It should be noted, however, that 60.0 percent of the high place attachment sample are in favor of closing down campsites for recovery and only 5 percent are "opposed" to this practice. A further 25.0 percent of the sample felt that closing down the site would depend upon the individual situation, while 10.0 percent of the sample had no opinion or felt that this technique did not apply to the canyon. Those respondents with a low sense of place attachment were generally not as strongly in favor (50.0%) of closing down campsites as were those with a high sense of place attachment. The low place attached group were also more "opposed" to closing down campsites (21.1%) as compared to the high place attachment group (5%).

This disparity may be a reflection of the difference in wilderness expectations between the two groups where the low place attachment group does not see the need to close down or rest a site. Overall, the sample was in favor (59.7%) of closing down sites to rest them, while 21.6 percent of the sample felt that this

management tool should be used only if the situation demanded it. The population mean was 3.551, which indicates that the sample was "somewhat" in favor of closing down specific sites to rest them and to allow for the eventual recovery.

Both low and high place attachment groups were "opposed" to the management practice of developing formal campsites to minimize impacts on the rest of the canyon. The strongest opposition to the development of formal campsites to minimize further impacts came from the group with a low sense of place attachment. Only 7.9 percent of the sample were "somewhat" to "very much" in favor of a developed campsite while 68.5 percent were against the idea. Over 60.0 percent of those who were against the development of the formal campsite were "very much against" it, with 15.8 percent of the opinion that development may depend upon specific criteria.

Those respondents with a high sense of place attachment were also unanimous in their opposition to developed campsites. Only 15.0 percent of the sample were in favor, while 60.0 percent of the sample was "opposed" to the practice. The 15.0 percent of the sample that was in favor was only "somewhat" in favor of developed campgrounds. It should be noted, however, that 20.0 percent of the sample felt that development of formal campsites would depend on specific localized conditions. Overall, the sample population was generally "opposed" (50.1%) to the development of formal sites, with only 27.8 percent of the sample "somewhat" to "very much" in favor of the development. It should be noted however, that 19.9 percent of the sample felt that management options of this type would depend on unspecified conditions.

Restoration of damaged and severely impacted sites is difficult and raises some ethical questions, such as the level of human interaction that is acceptable in

restoring a site to a more nearly natural setting. Almost *all* actions required to restore sites in the wilderness involve temporary closure to ensure rest and recovery time. This process is difficult enough to ensure in a developed setting and is in most cases, impossible to ensure in the wilderness. Keeping people away from recovering sites can best be approached through an educational process i.e., letting hikers know why the sites have been closed. A management technique used in other wilderness areas involves the fencing of the site; the fencing can be either symbolic or full strand fencing. The fencing technique has proved to be appropriate and has worked well in certain wilderness areas in the west. (See Table 6 below).

Table 6. Management alternatives for competition and campsite degradation

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPU - LATION MEAN
Closing some campsites to allow recovery from overuse	50.0	60.0	59.7	3.511
Development of a formal camp- site to minimize impacts in canyon	7.9	15.0	27.8	2.477

Visitor Concerns with Resource Degradation

Increased use of a wilderness area will potentially lead to resource degradation at sites other than campsites. However, when respondents were asked about erosion along the trail system, a minority of visitors felt that erosion was a problem. Once again, respondents with a high level of place attachment identified eroded trails as more of a problem (42.1%) than did a smaller segment (16.2 %) of those with a low sense of place attachment. Only 37.8 percent of the total sample identified trail erosion as a problem; the sample mean was 4.409, which indicates that few visitors identified erosion as a problem. The low incidence of identification may be due in part to the rugged topography and the rocky trail systems which do not tend to show erosion as severely as sandy soils, beach sites, and river benches.

Increased use has lead to the development of multiple trails near popular campsite areas. There is a significant difference in the way that visitors with a high sense of place attachment view multiple trails as compared to low place attached visitors. Respondents with low place attachment do not appear to be overly concerned with multiple trails, as only 32.4 percent of the sample felt that these multiple trails were a problem. Those respondents who have a high sense of place attachment strongly identified multiple trails (73.7%) at popular sites as a problem. A Student's t test revealed significant differences between low and high place attached groups at the .01 level of significance. When the sample population is examined, a "slight" majority of 51.1 percent regarded multiple trails as a problem (please see table 7 on the following page).

Table 7. Visitor problems with resource degradation

QUESTION	LOW PLACE ATTACHMENT % RESPONSE A PROBLEM	HIGH PLACE ATTACHMENT % RESPONSE A PROBLEM	TOTAL POPULATION % RESPONSE A PROBLEM	POPULATION MEAN PROBLEM
Erosion of trails	16.2	42.1	37.8	4.409
Multiple trails at popular sites	32.4	73.7**	51.1	4.183

** Significant at the .01 level

Problems Caused by Cattle in the Canyon

Cattle are present in the canyon as the result of permitted ranching activities. Many wilderness purists do not consider cattle to be part of the wilderness experience as cattle are basically an introduced species and not indigenous to a wilderness setting. The signs of cattle and competition with cattle for space at campsites has lead to many visitors to the canyon identifying cattle, and their presence in the canyon as a problem.

Neither low or high place attached groups of respondents identified the presence of cattle as a "very serious problem" in the canyon. Respondents with high sense of place attachment were marginally stronger in their perception of the presence of cattle in the canyon as a problem. A minority of 47.4 percent of the high

place attached group felt that the presence of cattle in the canyon was a problem, whereas 44.7 percent of those respondents with a low sense of place attachment did. A Student's t test, however, revealed significant differences between how low and high place attached groups view the presence of cattle in the canyon. The difference between the two groups was significant at the .01 level. As a whole, the sample population did not view the presence of cattle in the canyon as a "serious problem", with only 34.3 percent of the sample indicating that the presence of cattle was a problem. The population mean of 4.182 shows the samples consensus to be that the presence of cattle is not seen as a problem in the canyon.

However, when respondents were asked as to whether signs of cattle in the canyon were a noticeable problem, both groups were unanimous in their response. It is presumed that signs of cattle are to be interpreted as dung, cattle trails, and hoofprints in the canyon. Once again these signs of cattle may be unacceptable to purists as they do not fit into the wilderness experience framework. Both low and high place attachment groups considered the signs of cattle in the canyon to be a problem. Interestingly, both low and high samples responded, with 52.6 percent of the sample identifying the signs of cattle in the canyon as a problem. A larger proportion of the high place attachment sample (26.3%) viewed the problem as "very serious" while a smaller proportion (18.4%) of low place attached respondents viewed the problem as being "very serious." The difference in the perception of the problem between low and high place attachment was meaningful at the .01 level of significance based on a Student's t test. When the overall sample is considered, only 44.1 percent of all respondents viewed the signs of cattle in the canyon as a problem. The population mean of 3.982 reveals that, as a whole, the sample viewed the signs of cattle in the canyon as a problem, but not an overwhelming one.

Both sets of respondents were closely correlated with respect to their perception of the problem of the signs of cattle at campsites. High place attachment respondents were marginally stronger in their perception of the problem (42.1%) as compared to the low place attachment group with 41.7 percent. It should be noted however, that 21.1 percent of the high place attachment felt that the signs of cattle at campsites were a "very serious problem" whereas only 13.9 percent of those with a low sense of place attachment did. Generally, the sample population did not appear to consider signs of cattle at the campsites to be a "serious problem". Only 35.2 percent of the sample population felt that the signs of cattle at the campsites was a "serious problem". (See Table 8 below)

Table 8. Visitor Perceptions of cattle in Paria canyon

QUESTION	LOW PLACE ATTACHMENT % RESPONSE A PROBLEM	HIGH PLACE ATTACHMENT % RESPONSE A PROBLEM	TOTAL POPULATION % RESPONSE A PROBLEM	POPULATION MEAN PROBLEM
Presence of cattle in the canyon	44.7	47.4**	34.3	4.182
Signs of cattle in the canyon	52.6	52.6**	44.1	3.982
Signs of cattle at campsites	41.7	42.1	35.2	4.179

** Significant at the .01 level

Management Of Cattle

When considering the issues of managing cattle, both groups of respondents were in favor of removing cattle from the canyon as an appropriate management measure. There was little difference in opinion between low and high place attached groups as both were in favor of removal. Of the low place attached group, 64.3 percent were in favor of removal, while the high place attachment group was 65.0 percent in favor. The difference between the way that the two groups approach the problem is subtle but does point out the divergent nature of the groups. All the high place attached individuals who wanted the cattle removed were "very much" in favor of removal, while there was a 40.0 to 60.0 percent split between "somewhat" and "very much" in favor for the low place attachment group. On the other side, 25.0 percent of the high place attachment group was opposed to removal, while 25.6 percent of the low place attachment group were "opposed" to removal. A Student's t test revealed a difference in the way that high and low place attachment groups viewed the removal of cattle from the canyon; this difference was significant at the .01 level.

When the overall sample is considered, a majority of 60.5 percent of the sample was in favor of removing cattle from the canyon, while a minority of 17.4 percent were "opposed". Those respondents who felt that the management technique should to depend upon the situation comprised 9.0 percent of the sample.

There appears to be little apparent approval amongst either place attached group for fencing to keep out cattle or to separate cattle from visitors. Both low and high place attached individuals were "opposed" to fencing, with only 1.1 percentage points separating the sample. Those with a low sense of place

attachment who "opposed" fencing comprised 51.1 percent of the sample. In the case of high place attached individuals, 50.0 percent of the sample were "opposed" to fencing out cattle or using fences to separate cattle from visitors. A minority of 36.8 percent for low place attached individuals and 40.0 percent for high place attached individuals was in favor of fencing to separate. However, when the total sample is considered, the difference between the two positions becomes blurred. In the sample, the preferred management technique reversed, with 39.0 percent of the sample in favor of fencing and 33.4 percent "opposed". It should be noted, however, that 13.5 percent of the sample felt that the appropriateness of any specific management technique depended upon a number of unstated conditions. The population mean of 2.678 places the sample "somewhat" against the management use of fencing to separate cattle from visitors. Respondents perceptions of management alternatives for cattle are listed below in Table 9.

Table 9. Alternatives for managing cattle in Paria canyon

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPULATION MEAN
Removal of cattle from canyon	64.3	65.0**	60.5	3.434
Fencing to separate cattle from visitors	36.8	40.0	39.0	2.678

** significant at the .01 level

Rules and Regulations

Respondents were asked about the need for or the lack of rules and regulations governing access to and behavior within the PC-VCW. It would appear from the analysis that respondents were satisfied that there were sufficient rules and regulations in the canyon to ensure acceptable day to day experiences. The question, however, did not attempt to differentiate between what types of rules were being considered.

Rules and regulations have multiple objectives in the wilderness, most of which relate to management issues. Some of the specific aspects of wilderness rules and regulations are; 1) ensuring the preservation of cultural and historic artifacts, 2) preserving the natural resources, 3) health and sanitation, and 4) other rules designed to preserve a certain level of the wilderness experience. When the question was asked of respondents whether there were too few rules and regulations in place, no attempt was made to differentiate what rules or what regulations.

Neither group of respondents felt that there were too few rules or regulations in place. Of those respondents with a high sense of place attachment only 26.3 percent felt that there were too few rules. Fewer respondents (16.2%) with low sense of place attachment felt that there was a "serious problem" of too few rules and regulations. There was a significant difference at the .05 level in the way that low and high place attachment visitors viewed rules and regulations. In the overall sample, only 17.0 percent of respondents felt that too few rules and regulations were a problem in the canyon.

A small percentage of the overall population (14.6%) felt that there was a problem with the level of law enforcement in the canyon. The same held true for both low and high place attached groups. Only 11.4 percent of low place attached respondents and 15.8 percent of high place attached respondents felt that there was insufficient law enforcement in the canyon. It would not be an overstatement to say that most visitors to the canyon do not feel as if there was insufficient law enforcement in the canyon. Visitors perceptions of problems with law enforcement in the canyon are summarized below in Table 10.

Table 10. Visitor perceptions of problems with Law Enforcement in the canyon

QUESTION	LOW PLACE ATTACHMENT % RESPONSE A PROBLEM	HIGH PLACE ATTACHMENT % RESPONSE A PROBLEM	TOTAL POPULATION % RESPONSE A PROBLEM	POPU- LATION MEAN PROBLEM
Not enough law enforcement	11.4	15.8	14.6	4.728
Too few rules and regulations	16.2	26.3*	17.0	4.756

* Significant at .05 level

Management Practices For Law Enforcement

The differences between place attached groups were noticeable when respondents were asked to assess the various management techniques that would enhance and protect the wilderness nature of the canyon with respect to law enforcement and regulation. Both groups were in favor of the management agency providing more information about rules and regulations in the canyon. The strongest supporters of this management type were the low place attached visitors with 64.1 percent in favor of additional information on rules and regulations. Likewise, the high place attachment respondents were also in favor of more information on rules and regulations but to a lesser degree (55.0). In both cases, a minority of the respondents was "opposed" to more information on the rules and regulations 10.1 percent and 10.0 percent respectively. There was a significant difference, however, between the groups with respect to how they viewed the issue of more available information on rules and regulations. The significant difference was at the .01 level. When the total sample of respondents is considered, a minority of 18.4 percent were "opposed" to more available information while 70.9 percent of respondents were in favor of further information.

Respondents were divided as to the need for fewer rules and regulations in the canyon. On the other hand, however, those respondents with high place attachment values were generally "not in favor" of reducing the rules and regulations (55.0%). Only 5 percent of the high place attached sample were in favor of reducing rules and regulations. The difference between the two groups, in light of their desire to reduce rules and regulations, is significant at the .05 level. When the overall sample is considered, only 15.0 percent were in favor of

reducing regulations, whereas, 41.7 percent were "opposed" to reducing rules and regulations in the canyon.

Respondents were generally divided over the issue of requiring a permit to enter the canyon. In the case of the low place attached group, 34.1 percent were against the idea of a permit, while 46.4 percent were in favor of a permit system. Those respondents who felt that certain unstated permit criteria should be defined comprised 14.6 percent of the sample, which could tip the balance to either side. Respondents with a strong sense of place attachment were more polarized about the permit issue, as 50.0 percent of the sample was against a permit system, with 40.0 percent in favor. The remaining 10.0 percent felt that certain unstated criteria had to be defined before a permit system could be enforced. When the overall sample is considered, the polarization diminishes as a minority of 26.1 percent of the sample is against permits, while a majority of 56.6 percent is in favor of a permit system. Traditionally, those visitors with high place attachment values have been "opposed" to a permit system but may be more in favor of a system that controls use and ensures the integrity of a wilderness experience. The management alternatives for rules, regulations and permits are summarized below in Table 11.

Table 11. Management alternatives for rules, regulations and permits

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPU - LATION MEAN
More available information about rules and reg- ulations while in the canyon	64.1	55.0**	70.9	3.534
Fewer rules and regulations	28.2	30.0*	15.0	2.366
Requirement of a permit to enter the canyon	46.4	40.0	56.6	3.461

Miscellaneous Problems

There were two categories of problems affecting canyon visitors which were miscellaneous in nature. The problems (bad weather and airplanes flying overhead), are beyond any scope of control by a management agency. The presence of airplanes overhead is considered by some wilderness purists to constitute an unnecessary intrusion of man into the wilderness. However, the flight of airplanes over the canyon cannot be controlled as it is in the case of the Grand Canyon National Park. Therefore, airplanes cannot be regarded as anything more than an unavoidable nuisance or a distraction. Those respondents with a high sense of place attachment tended to regard the presence of airplanes as more of

a problem (42.1%) than visitors with a low sense of place attachment (29.7%). There was a significant difference at the .05 level between how the two place attached groups viewed the problem of airplane overflight in the canyon. Overall, the survey population did not consider the flight of airplanes over the canyon to be more than a "slight" problem, as 31.8 percent felt that this was a problem. Of the 31.8 percent, only 20.12 percent felt that it was a serious or "very serious problem". There is presently no effective control for airplane flight over the canyon. It is possible that altitude restrictions on overflight levels can be included in the management plan for the Canyon.

The issue of bad weather in the canyon also proved to be a dividing point between the place attached groups. It should be kept in mind that the question of bad weather was rather general and did not describe the actual bad weather specified. As such, the bad weather in question may have been too hot, too cold, too much rain or not enough water. In general, respondents with high place attachment and high wilderness values would tend to be less concerned with the externalities of weather.

The fact that the weather may not be perfect should not detract from the level of experience as weather is an unalterable part of the wilderness equation. A probable hypothesis is that low place attachment visitors may be more affected by adverse weather and may tend to regard it as a problem. There was a significant difference at the .001 level between the two groups' response to bad weather, as 33.03 percent of the responding low place attached group felt that bad weather was a "serious" to "very serious problem". On the other hand, none of the high place attached sample felt that bad weather was a "serious" or "very serious problem"; only a "moderate" or "slight problem" at most. In all, 16.2 percent of the low place attached sample felt that bad weather was a problem,

whereas 21.1 percent of the high place attached respondents felt it was a "slight" to "moderate problem." When the whole sample population is considered, only 15.7 percent believed that bad weather to be a "slight" to "very serious problem". From a management perspective, bad weather like airplane overflight, is also an uncontrollable variable. High visitor use periods in the canyon tend to be in the cooler months, before June and after August, which leads to peak use being determined, in part, by the cooler weather. The nature of the wilderness experience includes the acceptance of weather conditions. If visitors seek a wilderness experience they must expect it to include the possibility and constraints of adverse weather. The results of the miscellaneous questions are summarized in Table 12 below.

Table 12. Miscellaneous problems re weather and airplanes

QUESTION	LOW PLACE ATTACHMENT % RESPONSE A PROBLEM	HIGH PLACE ATTACHMENT % RESPONSE A PROBLEM	TOTAL POPULATION % RESPONSE A PROBLEM	POPULATION MEAN PROBLEM
Bad Weather	16.2**	21.1	15.7	4.754
Airplanes flying over - head	29.7	42.1*	31.8	4.430

* Significant at the .05 level

** Significant at the .01 level

Behavioral and Information-Related Problems

The final set of problems that will be dealt with in this study pertains to visitor impacts which, in most cases, result from a lack of information about the wilderness, or lack of knowledge of wilderness behavior and ethics. The final set of problems that visitors were asked to respond to were 1) the behavior of other people, 2) lack of information on appropriate behavior, and 3) lack of signs in the area. All three problem areas have their roots in the lack of visitors' wilderness knowledge, education and/or understanding of wilderness ethics. Hendee et al. (1978) in their book, Wilderness Management, developed a typology of visitor actions that were subject to management. The problems under discussion fell into three of Hendee and Lucas' typologies of visitor actions, these are: "careless, unskilled and uninformed actions." The remedy for all of these negative or unavoidable visitor impacts is through education, persuasion, and information dissemination.

The problem of other peoples' behavior is not considered to be extremely important by either high or low place attached groups. In actual fact, the high place attached group considered other visitors' behavior to be less of a problem (15.8%) than low place attached visitors (29.7%). Both groups had similar numbers of respondents (33.35 percent for high place attached and 36.3 percent for low place attached respondents) who considered other visitors' behavior to be a serious or "very serious problem". Overall, the sample population did not view other visitors' behaviors to be a problem, since only 21.0 percent of the sample identified this problem.

A caveat needs to be stated at this point, regarding interpretation of the overall populations as well as the place attached visitors responses to this

question. First, the question was not specific in pinpointing what constituted adverse visitor behaviors. Secondly, the high use of the canyon and its popularity may well have already lead to the displacement of those wilderness users who would find other visitors' actions and behavior offensive in a wilderness setting. The potential that the latter hypothesis is correct is borne out by the fact that there was little significant difference in the way that low and high place attached groups considered the problem of adverse visitor behavior.

There was, however, a significant difference in the way low and high place attached respondents viewed the question of a lack of information on appropriate behavior in wilderness settings. The hypothesis that low place attached individuals would tend to have less knowledge or understanding about wilderness ethics and behavior is supported in part by this data. Low place attached visitors (25.7%) identified a lack of information on appropriate behavior as a problem, contrasted to only 10.5 percent of high place attached respondents. The difference between the two groups was significant at the .01 level. Overall, the sample population did not view the lack of information on appropriate behavior as being a major problem, as only 22.1 percent identified it as such.

The last problem identified by respondents was not related to visitors or their behavior, but rather considered the issue of the lack of signage in the area. This question was analyzed in conjunction with other behavioral and information-based questions since the root of the signage question deals with wilderness ethics and knowledge. Many wilderness purists, as well as managers, deplore the use of signage in the wilderness, seeing it an intrusion of mankind.

Signs in the wilderness can be either directional, informational, interpretive,

or regulatory. Directional signs are generally used at trailheads and obvious forks in the trail. The use of directional signs could be overcome with accurate wilderness maps. It should be noted that the current set of USGS maps were last ground-truthed in 1969, making them woefully out of date for present day wilderness areas. Interpretive signs can be replaced with accurate guidebooks which, in themselves, far exceed the information which can be contained on an interpretive sign. In some cases, signs are essential to inform visitors of closed campsites, restrictions on certain types of use, fire protection, etc. However, most wilderness managers agree that regulatory signs should be kept to a minimum and used only where and when necessary to fulfill visitor management objectives. A lack of knowledge about wilderness, combined with constraints placed on facility development by the Wilderness Act may leave visitors unknowlegable bewildered at the lack of directional and informational signage in the canyon.

The hypothesis that the place attached groups would desire different levels of signage did not hold according to the data collected. The lack of signs was regarded as more of a problem by those respondents with a high sense of place attachment (35.5%) than those with a low sense of place attachment (16.2%). However, when the responses are analyzed, low place attached visitors considered the lack of signs as more of a "serious problem" (83.3% of sample) than did high place attached visitors (14.2% of sample). Overall, 29.6 percent of the sample population considered a lack of signs to be a "slight" to "serious problem" in the canyon. The responses are summarized in Table 13 on the following page.

Table 13. Behavior and information related problems

QUESTION	LOW PLACE ATTACHMENT % RESPONSE A PROBLEM	HIGH PLACE ATTACHMENT % RESPONSE A PROBLEM	TOTAL POPULATION % RESPONSE A PROBLEM	POPU - LATION MEAN PROBLEM
Behavior of other people	29.7	15.8	21.0	4.647
Lack of information on appropriate behavior in canyon	25.7	10.5**	22.1	4.598
Lack of signs in area	16.2*	35.0	29.6	4.530

* Significant at .05 level

** Significant at .01 level

Management for Visitor Behavior and Information Issue

The majority of the remaining management issues deals with the use of informational tools, and how information can be used to enhance the wilderness experience in the canyon. The remaining management techniques that do not directly depend on information deal with issues of density and crowding and will be considered separately.

Directional signs in the area were not favored by either place attached group, with no evidence shown of a significant difference between place attached groups. Both high and low place attached groups were against the use of directional signs, with the strongest opposition to these types of signs originating with the low place attached group. The low place attached group was overwhelmingly "opposed" to directional signs in the area (75.0%), with only a minor 15.0 percent of the sample being in favor of directional signs. On the other hand, the high place attached group had a narrow majority (50.0%) "opposed" to the use of directional signs and a surprising 40.0 percent of the sample in favor of signs. This disturbing detail may serve to further point out the probability that wilderness purists have already been displaced from the canyon. When the overall sample is considered, a narrow majority of 56.7 percent was "opposed" to signs, whereas, those in favor of signs comprised a relatively minor 33.3 percent. Those respondents who felt that the use of signs depended on unstated further information comprised a significant 10.0 percent of the sample.

Neither place attached group was in favor of interpretive signs at major attractions in the canyon. This is evident by past research (Butterworth, 1970; Schoomaker, 1975) which indicated that visitors to wilderness areas would rather use a trail guide or interpretive literature provided in advance, than have interpretive signs in the wilderness. Once again, the low place attached group was the most adamant of the two groups with respect to the inappropriateness of interpretive signs at major attractions. An overwhelming 80.0 percent of the sample was "opposed" to the introduction or use of interpretive signs in the canyon as a management tool. Those in favor of such signs in the low place attached group comprised a relatively insignificant 12.5 percent. Those visitors in the high place attached group who were in favor of interpretive signs comprised a significant 30.0 percent of the sample, while 65.0 percent were

"opposed" to that management technique. This may once again point to the previously mentioned displacement of pristine wilderness users. When the overall sample is considered, 60.2 percent of the sample was "opposed" to the use of signs, and 30.4 percent were in favor of interpretive signs at major trail attractions. The need for interpretive signs at major attractions could be overcome by the use of a well thought out guidebook and possibly by trail head information sources.

Both groups were "opposed" to the use of directional signs that point out the way to major trail attractions such as pictographs, ruins, etc. This is consistent with the spirit of wilderness, in that visitors usually want to experience some sense of adventure and discovery as a part of the wilderness experience. In the open comments section of the questionnaire a number of respondents complained that they were unable to find Wrather Arch or that it was incorrectly marked on the map. The responses for both groups were similar in that they both "opposed" the use of directional signs to major trail attractions. The low place attached group were more "opposed" (69.2%) to the use of these types of signs than were the high attachment groups (55.6%). Those in favor of signs comprised a minor 20.5 percent of the low place attached sample and a more significant 33.4 percent of the high place attached sample. The two groups were closer in the percentage of respondents feeling that this management technique depended upon further information or on the situation, with 10.3 percent and 11.4 percent for low and high placed groups respectively. Overall, a narrow majority of 55.1 percent of the total sample was against the use of directional signs to major attractions, while 31.9 percent were in favor.

Both groups were in favor of more information about the canyon and its features. The question did not ascertain when the visitors wanted this information i.e.,

in the planning stages, on their trip, or in brochures, guidebooks, etc. Both groups were once again close in their desire for more information with high place attached visitors (65.0%) having a slight edge over low place attached individuals (61.5%). Those "not in favor" of further information comprised a relative minor 23.1 percent and 25.0 percent of the low and high placed groups respectively. When the overall sample is considered, a strong majority of 65.0 percent of the sample favor more information, whereas a minority of 20.3 percent were "not in favor" of further information about the canyon and its features.

There was a significant difference between the groups with respect to management techniques which would provide more information on appropriate behaviors designed to minimize visitor impacts upon the canyon. Both groups were in favor of more information on appropriate behavior in the canyon. What differed however, was the degree to which the high place attached visitors were in favor of further behavioral information to lessen impacts. It is postulated that high place attached individuals are more concerned with inappropriate behavior in the wilderness and are offended by different situations than are low place attached individuals. Both groups were in favor of further information as a management technique, with low place attached visitors being 75.0 percent in favor and high place attached individuals 85.0 percent in favor. The difference lies in the fact that no respondents in the high place attached group were opposed, whereas 17.5 percent of the low place attached group were "opposed" to some degree on the need for further behavioral information. The difference between the two groups was significant at the .01 level. An overwhelming 80.2 percent of the total sample were in favor of further information, with a minor 10.2 percent "opposed" to further behavioral information. For this information to be used constructively by future visitors, a regulatory mechanism will need to be employed, that will ensure that visitors have a knowledge of appropriate behaviors prior to entry

in the canyon.

There was a significant difference in the way that low and high place attached groups viewed the possibility of a required education program on appropriate behaviors in the canyon. The potential requirement of a pre-use education program may be perceived as being elitist or at least of forcing management's viewpoint on users. High place attached respondents were more in favor (30.0%) of this management technique than were low place attached individuals (18.5%). There was, however, no majority statement in approval of this method, as 44.7 percent of low place attached individuals and 30.0 percent of high place attached individuals were "opposed" to this management technique. Those respondents who felt that implementation of this management technique should depend upon further information comprised a relatively influential 31.6 percent and 35.0 percent of the respective high and low place attached groups. This management technique would be difficult to enforce or ensure, and would probably require a worsening of wilderness experiences by a majority of individuals before it could be implemented. Overall, 28.7 percent of the total sample were in favor of the technique, whereas 35.0 percent were "opposed" and a significant 30.1 percent felt that this may be determined by the situation.

Both groups were in favor of more available information about drinking water in the canyon. The high place attached group was more in favor of this practice (85.0%) than were the low place attached group, with 55.2 percent in favor. Those "not in favor" comprised only 10.0 percent of the high place attached sample and 5.2 percent of the low place attached sample. The difference, however, is noticeable in the fact that 15.8 percent of low place attached individuals had no opinion or felt that this practice did not apply, and 23.7 percent of the same group felt that this type of management technique depended upon unstated specific

conditions. Overall, 72.5 percent of the total sample were in favor of further information being made available on drinking water in the canyon. The management alternatives dealing with the use of information are summarized in Table 14 on the following page.

Table 14. Management alternatives for dissemination of information

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPU - LATION MEAN
Directional signs in the area	15.0	40.0	33.3	2.461
Interpretive signs at major attractions	12.5	30.0	30.4	2.352
Signs directing one to major attractions	20.5	33.4	31.9	2.464
More available information about the canyon and its features	61.5	65.0	65.0	3.621
More available information about appropriate behaviors to mini- mize impacts while in canyon	75.0	85.0**	80.2	4.105
Required education program on appro- priate behavior	18.5	30.0**	28.7	2.705
More available information about drinking water	55.2	85.0	72.5	3.800

** Significant at .01 level

Management Techniques to Control Density and Preserve Experiences

One of the most direct methods to control density in the canyon would be to place limits on the number of people entering the canyon per day. This would initially limit the number of individuals and thereby result in a possible potentially greater degree of isolation and an improved quality of wilderness experience. Both place attached groups were in favor of limiting the number of visitors allowed into the canyon per day. The low place attached group were most in favor (53.8%), while the high place attached group were marginally in favor of the management technique (50.0%). Neither group was strongly in favor of the technique, as a quarter of both groups was "opposed" to the idea i.e., 25.0 and 25.1 percent for low and high groups respectively. A minor 12.8 and 15.0 percent of the respective samples, however, felt that this management technique would depend on further unstated information. When the overall sample is considered, 59.1 percent were in favor of limiting the number of persons allowed into the canyon per day while 20.6 percent were "opposed" to this management technique.

There was a significant difference between the groups with respect to the management technique of limiting the number of groups that could go into the canyon. This is consistent with the hypothesis concerning the desired wilderness experiences of high place attached individuals. High place attached respondents are more affected by contact with groups and large numbers of individuals traveling together than they are by individuals alone. Therefore, managing the number of groups and group size would address their preferences. Both groups were in favor of this management technique, with low place attached individuals being 60.0 percent in favor and high place attached individuals 65.0 percent in favor of this technique. A difference to note between the groups, was that, while 7.5

percent of the low place attached sample had no opinion or felt that the question was not applicable, none of the high place attached group responded this way. Overall 68.5, percent of the sample felt that this management technique was appropriate, while a minor 16.2 percent were "opposed" to this technique.

An overwhelming majority of all respondents were in favor of the management technique of limiting the maximum size to ensure that the wilderness experience was enhanced. There was a high correlation between groups with respect to the limits on the number of groups and limits on the maximum size of a group. The size and number of groups may substantially impact the quality of a wilderness experience for both low and high place attached individuals. Both groups were in favor of the technique, with 75.0 percent of the low place attached sample and 80.0 percent of the high place attached sample approving of the technique. The difference between the groups stands out in the fact that 15.0 percent were unsure that the question was applicable, whereas no high place attached respondents checked that category. When the overall sample is considered, an overwhelming 81.8 percent of the sample favored a reduction in the maximum size of a group with only 8.7 percent being "opposed" to this technique.

Another method of relieving the negative stress of crowding in the canyon would be to assign campsites, especially for the first two days; this would ensure access to the canyon but fix the parties' itineraries in the canyon. This method of rationing may ensure a higher degree of solitude and potential wilderness experience for individuals and parties. Both groups were overwhelmingly "opposed" to this management technique. No other management technique in the questionnaire received such unanimous disapproval as the assignment of campsites. High place attached individuals were 95.0 percent "opposed" with 5.0 percent of this group indicating that this was not applicable or that they had no opinion on the

matter. Only an extremely minor 2.6 percent of low place attached individuals was in favor of this technique, while an overwhelming majority of 84.6 percent were "opposed" to the technique. The total sample was also against the technique, with 75.0 percent "opposed" and only an insignificant 7.8 percent of the sample in favor of the technique. Respondents appear to rate this technique so unpopularly because it places too much control over itinerary and possible wilderness experience in the hands of the management agency.

Finally there was a significant difference between groups with respect to the management technique of restricting the number of visitors during certain periods of heavy use. This technique may prove to be the most effective density control mechanism since peak use and crowding combined with diminished wilderness expectations are usually concomitant. Both groups are in favor of restrictions for heavy use periods, with 65.0 percent of low place attached respondents and 63.2 high place attached respondents being in favor. The difference between the two groups lies in the fact that 7.5 percent of the low place attached sample had no opinion on the matter, whereas no high place attached respondents answered that way. Another interesting difference between the groups is exhibited by the fact that 26.3 percent of the high place attached respondents indicated that this technique might be seen as favorable if the situation warranted it. An overwhelming 74.4 percent of the total sample were in favor of the technique, while a relatively minor 9.9 percent were "opposed" to it. The responses to the management techniques applicable to controlling densities and preserving experiences are listed in Table 15 on the following page.

Table 15. Management techniques to control density and preserve experiences

QUESTION	LOW PLACE ATTACHMENT % RESPONSE IN FAVOR	HIGH PLACE ATTACHMENT % RESPONSE IN FAVOR	TOTAL POPULATION % RESPONSE IN FAVOR	POPU - LATION MEAN
Limits on number of people enter- ing the canyon	53.8	50.0	59.1	3.530
Limits on number of groups enter- ing the canyon	60.0	65.0**	68.5	3.796
Limits on maximum size of groups	75.0	80.0**	81.8	4.215
Assigned camp- site to ensure access but set itinerary	2.6	0.0	7.8	1.775
Restrictions on numbers of visitors during periods of heavy use	65.0	63.2**	74.4	3.967

** Significant at the .01 level

CONCLUSION

Increased use of the Paria Canyon - Vermillion Cliffs Wilderness area has lead to numerous management problems in the canyon. Respondents were asked through a questionnaire to identify problems that they had encountered on their past trips to Paria Canyon. Respondents were also asked about specific management techniques or practices that they would favor to overcome previously identified problems in the canyon. The respondents identified five broad categories of problem areas for the canyon, these were:

- Litter and toilets;
- Campsite degradation and competition;
- Resource degradation;
- Presence of cattle in the canyon; and
- Appropriate behavior in the wilderness.

Respondents also identified five broad management categories to combat the problems that they had identified from previous trips to the canyon, these were:

- Management of people;
- Management of information;
- Management by rules and regulations;
- Management by use of developed campsites; and
- Management by removal of cattle.

Significant Problems and Their Management Alternatives

For purposes of comparison respondents were classified as having "low place attachments" or "high place attachments."

In the case of the first identified problem of litter and toilet sites, the following problems were identified as being significant. Litter at campsites was identified by both high and low place attached groups as a significant problem. A significant proportion of high place attached respondents identified the encroachment of toilet sites on campsites as a problem. Both sets of respondents were in favor of the management agency providing more information on the disposal of human waste as a technique to control the problem of waste disposal in the canyon.

The next broad problem area was that of campsite competition and degradation. Vandalism was identified as a problem area by high place attached respondents. High place attached respondents also identified signs of overuse and the physical impact of other visitors as significant problems. Finally, the evidence of fire rings at campsites was also identified as a significant problem area by both sets of respondents. Neither of the respondent groups were in favor of mandating the use of firepans or banning open fires in the canyon. When considering the problems of campsite competition and degradation, both the respondent groups were in favor of closing overused campsites to allow for recovery. Both groups, however, were emphatically opposed to the development of a formal campsite in the canyon to minimize high use impacts.

In the case of resource degradation, multiple trails at popular sites were considered to be a problem by the high place attached respondents. No management

techniques designed to deal with the issue of trail erosion or multiple trails at popular sites were suggested in the questionnaire.

Not only the presence of cattle, but also signs of cattle in the canyon were seen as a significant problem by the high place attached group of respondents. Both groups of respondents considered the removal of cattle from the canyon to be the appropriate management technique. Both groups of respondents, however, did not in approve of fencing the canyon to keep cattle and hikers separated.

Neither set of respondents considered the issue of law enforcement and rules and regulations to be a problem area in the canyon. Only the high place attached group felt that there were insufficient rules and regulations in place within the canyon. Both respondent groups considered education to be the most appropriate means of ensuring rules and regulation compliance in the canyon. No single group was in favor of requiring a permit to use the canyon.

Bad weather and airplane overflight were considered to be problems by both respondent groups. The questionnaire however, suggested no management alternatives for alleviating these specific problems.

In the case of behavior and information related problems, high place attached respondents considered the lack of information on appropriate behavior in the canyon to be a significant problem. On a related issue, low place attached respondents considered the lack of signs in the canyon to be a significant problem. Neither respondent group was in favor of the use of directional or informational signage in the canyon. High place attached respondents, however, were in favor of the management agency providing more information on appropriate behaviors in the canyon. High place attached respondents were also in favor of

an education program on appropriate behavior prior to entering the canyon.

Finally, both sets of respondents were generally in favor of controlling the density in the canyon by limiting group size, as well as the number of groups allowed in the canyon at any one time. Respondents were also in favor of restricting entrance to the canyon during heavy use periods. There was, however, no support for the management technique of assigning campsites within the canyon to ensure access essentially fixing the itinerary of hikers through the canyon.

Further research may be required to identify a management plan that would fall within the limits of acceptable change paradigm which limits options that can be applied to the management of the Paria Canyon - Vermillion Cliffs Wilderness. Specific areas of research should be directed at answering questions regarding the levels of appropriate management, the desired level of wilderness experience of users, and the acceptable levels of change.

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APPENDIX A
PARIA CANYON VERMILLION CLIFFS MANAGEMENT SURVEY



ARIZONA HOSPITALITY RESEARCH AND RESOURCE CENTER

November 7, 1989

Dear Paria Canyon visitor:

In cooperation with the Bureau of Land Management and the College of Natural Resources at Utah State University, we are conducting a survey of recent Paria hikers. The enclosed questionnaire can be completed in about 15 minutes.

Could you spare 15 minutes between now and November 30? Your response to the questionnaire is extremely important and absolutely confidential. The information you can provide is invaluable to the BLM in its continuing effort to manage the Paria Canyon-Vermilion Cliffs Wilderness while strengthening its potential for unimpaired enjoyment of visitors.

After completing the questionnaire, simply mail it in the enclosed envelope.

Sincerely,

Thomas C. Parker
Associate Director

Enclosure: questionnaire

P.S. Thank you for participating in the management of your public lands!

*Bev + Rich —
Here is the final draft of the
Paria instrument.*

Tom

PARIA CANYON HIKER QUESTIONNAIRE

PART ONE: YOUR RECENT VISIT TO PARIA CANYON

1. Which of the following statements explain how you and your companions decided to visit Paria Canyon?
(Please check the appropriate blanks)

- ___ a. We wanted to go backpacking somewhere new, and just happened to choose Paria Canyon.
- ___ b. We wanted to hike through a canyon in the Colorado Plateau, and Paria is a good example of canyon country.
- ___ c. We had heard or read that Paria Canyon is beautiful and worth the effort of backpacking.
- ___ d. One or some of us had hiked through Paria before, and wanted to show the others.
- ___ e. We wanted to return to a special place, and Paria Canyon was the only place we considered.

2. Please circle the day(s) of your visit to Paria and place a check mark under any which may have been holidays.

Sun Mon Tue Wed Thr Fri Sat

3. On your recent trip which included a visit to Paria, approximately how much of your free time did you allocate to each of the following activities?

>20% 16-20% 11-15% 6-10% 1-5% 0

- | | | | | | | |
|----|-------------------------------------|-----|-----|-----|-----|-----|
| a. | auto sightseeing | ___ | ___ | ___ | ___ | ___ |
| b. | observing wildlife | ___ | ___ | ___ | ___ | ___ |
| c. | taking photographs | ___ | ___ | ___ | ___ | ___ |
| d. | rockhounding, visiting mining sites | ___ | ___ | ___ | ___ | ___ |
| e. | observing local ranching activity | ___ | ___ | ___ | ___ | ___ |
| f. | fishing | ___ | ___ | ___ | ___ | ___ |
| g. | day hiking | ___ | ___ | ___ | ___ | ___ |
| h. | backpacking | ___ | ___ | ___ | ___ | ___ |
| i. | exploring side canyons | ___ | ___ | ___ | ___ | ___ |
| j. | sitting/contemplating | ___ | ___ | ___ | ___ | ___ |
| k. | sunbathing | ___ | ___ | ___ | ___ | ___ |
| l. | rock climbing | ___ | ___ | ___ | ___ | ___ |
| m. | studying nature | ___ | ___ | ___ | ___ | ___ |

4. The canyons and plateaus of the Paria represent a large area with many different places. Other than hiking in the main Paria Canyon, what places did you visit or explore? Please name or describe them in the space below.

5. How many other groups would you estimate you encountered while you were in Paria Canyon?

_____ None

_____ 5 - 7

_____ 1 - 2

_____ 8 or more

_____ 3 - 4

6. How did the number of groups you encountered compare to your expectations?

_____ Many more than I expected.

_____ More than I expected.

_____ About what I expected.

_____ Somewhat fewer than I expected.

_____ Many fewer than I expected.

7. What was the approximate size of the largest group you encountered?

_____ Did not encounter other groups.

_____ 16 - 20

_____ 1 - 5

_____ 21 - 30

_____ 6 - 10

_____ over 30

_____ 11 - 15

8. How did you feel about the groups you encountered?

_____ Their size was not a problem to me.

_____ Their size was somewhat a problem to me.

_____ Their size was a serious problem to me.

_____ The number of groups I encountered was more of a problem than their size.

_____ The behavior of persons in the group was more of a problem than their size.

9. Some people would prefer more signs at the trailheads or even in the canyon itself. If you feel that way, what types of signs would be most useful to you? (e.g. directional signs, interpretive signs.)

10. Information about problems you may have encountered in Paria Canyon would be helpful to managers. To what extent did you find each of the following to be a problem? Please circle the number that best describes how serious you found each to be.

	NOT A PROBLEM	SLIGHT PROBLEM	MODERATE PROBLEM	SERIOUS PROBLEM	VERY SERIOUS PROBLEM
a. Litter in canyon	5	4	3	2	1
b. Litter at campsites	5	4	3	2	1
c. Toilet paper at campsites	5	4	3	2	1
d. Vandalism	5	4	3	2	1
e. Signs of overuse of campsites	5	4	3	2	1
f. Toilet sites encroaching on campsites	5	4	3	2	1
g. Noticeability of toilet sites	5	4	3	2	1
h. Availability of campsites due to limited environmental conditions	5	4	3	2	1

	NOT A PROBLEM	SLIGHT PROBLEM	MODERATE PROBLEM	SERIOUS PROBLEM	VERY SERIOUS PROBLEM
i. Availability of campsites due to competition with other visitors	5	4	3	2	1
j. Evidence of fire rings in campsites	5	4	3	2	1
k. Erosion of trails	5	4	3	2	1
l. Multiple trails at popular sites	5	4	3	2	1
m. Bad weather	5	4	3	2	1
n. Too few rules and regulations	5	4	3	2	1
o. Airplanes flying overhead	5	4	3	2	1
p. Not enough law enforcement	5	4	3	2	1
q. Behavior of other people	5	4	3	2	1
r. Lack of signs in the area	5	4	3	2	1
s. Lack of information on appropriate behavior	5	4	3	2	1
t. Presence of cattle in the canyon	5	4	3	2	1
u. Signs of cattle in the canyon	5	4	3	2	1
v. Signs of cattle at the campsite	5	4	3	2	1
w. Physical impacts of other visitors	5	4	3	2	1

11. There are a number of actions managers could take to maintain and enhance the Paria Canyon experience and protect the environment. How do you feel about the following potential management actions?

	VERY MUCH IN FAVOR	SOMEWHAT IN FAVOR	IT DEPENDS	SOMEWHAT AGAINST	VERY MUCH AGAINST	NO OPINION/NOT APPLICABLE
a. Toilets at campsites	5	4	3	2	1	0
b. More information on disposal of human waste	5	4	3	2	1	0
c. More restrictions on disposal of human waste	5	4	2	3	1	0
d. Directional signs in the area	5	4	3	2	1	0

	VERY MUCH IN FAVOR	SOMEWHAT IN FAVOR	IT DEPENDS	SOMEWHAT AGAINST	VERY MUCH AGAINST	NO OPINION/NOT APPLICABLE
e. Interpretive signs at major attractions	5	4	3	2	1	0
f. Signs directing one to major attractions	5	4	3	2	1	0
g. More available information about the canyon and its features	5	4	3	2	1	0
h. More available information about appropriate behaviors to minimize impact while in the canyon	5	4	3	2	1	0
i. More available information about rules and regulations while in the canyon	5	4	3	2	1	0
j. No open fires allowed in the canyon	5	4	3	2	1	0
k. Firepans allowed in the canyon	5	4	3	2	1	0
l. Limits on the number of persons who can enter the canyon per day	5	4	3	2	1	0
m. Requirement of a permit to enter the canyon	5	4	3	2	1	0
n. Limits on the number of groups that can enter the canyon in one day	5	4	3	2	1	0
o. Limits on the maximum size of a group	5	4	3	2	1	0
p. Assigned campsites, which would ensure access, but would fix one's itinerary	5	4	3	2	1	0
q. Removal of cattle from the canyon	5	4	3	2	1	0
r. Fencing to separate cattle from visitors	5	4	3	2	1	0
s. Closing some campsites to allow recovery from overuse	5	4	3	2	1	0
t. Required education program on appropriate behavior	5	4	3	2	1	0
u. More available information about drinking water	5	4	3	2	1	0
v. Restrictions on numbers of visitors during certain periods of heavy use	5	4	3	2	1	0

		VERY MUCH IN FAVOR	SOMEWHAT IN FAVOR	IT DEPENDS	SOMEWHAT AGAINST	VERY MUCH AGAINST	NO OPINION/NOT APPLICABLE
w.	Development of formal campsites to minimize impacts to the rest of the canyon	5	4	3	2	1	0
x.	Fewer rules and regulations	5	4	3	2	1	0

PART TWO: YOUR PERCEPTION OF PARIA CANYON

12. For each of the following statements, please indicate your level of agreement or disagreement by circling the appropriate number.

a. Spending time with my companions was the focal point of my trip through Paria Canyon.

STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
5	4	3	2	1

b. While hiking the Paria, I focused a lot of my attention on "the doing" of outdoor activities, such as hiking or camping.

SA	A	N	D	SD
5	4	3	2	1

c. I am very attached to Paria Canyon.

SA	A	N	D	SD
5	4	3	2	1

d. I feel no commitment to Paria Canyon.

SA	A	N	D	SD
5	4	3	2	1

e. While in the Paria, I really enjoyed using my outdoor skills.

SA	A	N	D	SD
5	4	3	2	1

f. I identify strongly with Paria Canyon.

SA	A	N	D	SD
5	4	3	2	1

g. While in the Paria, I spent a lot of time interacting with my companions.

SA	A	N	D	SD
5	4	3	2	1

h. In the future, I would rather explore different kinds of wilderness areas than to re-visit Paria.

SA	A	N	D	SD
5	4	3	2	1

i. Paria Canyon is great because of the activities I enjoy, such as backpacking or photography.

SA	A	N	D	SD
5	4	3	2	1

j. While in Paria, I really enjoyed sharing the experience with the others in my group.

SA	A	N	D	SD
5	4	3	2	1

k. I feel like Paria Canyon is a part of me.

SA	A	N	D	SD
5	4	3	2	1

l. No other place can compare to Paria Canyon.

SA	A	N	D	SD
5	4	3	2	1

m. While in Paria, I spent a great deal of time thinking about outdoor recreation activities that are important to me.

SA	A	N	D	SD
5	4	3	2	1

n. A major reason I now live where I do is to be close to the canyon country which includes the Paria Plateau.

SA	A	N	D	SD
5	4	3	2	1

- o. While in Paria, I thought a lot about my relationships with my companions.

SA	A	N	D	SD
5	4	3	2	1

- p. Paria Canyon means very much to me.

SA	A	N	D	SD
5	4	3	2	1

- q. I enjoy doing the activities I did in Paria Canyon more than I would enjoy doing them in any other area.

SA	A	N	D	SD
5	4	3	2	1

- r. I find that much of my life revolves around the Paria Plateau and Canyon Country.

SA	A	N	D	SD
5	4	3	2	1

- s. Being in Paria Canyon is a totally unique experience.

SA	A	N	D	SD
5	4	3	2	1

- t. The isolation of Paria Canyon helped me develop stronger bonds with members of my group.

SA	A	N	D	SD
5	4	3	2	1

- u. While in Paria, I often thought about how I could apply my outdoor skills.

SA	A	N	D	SD
5	4	3	2	1

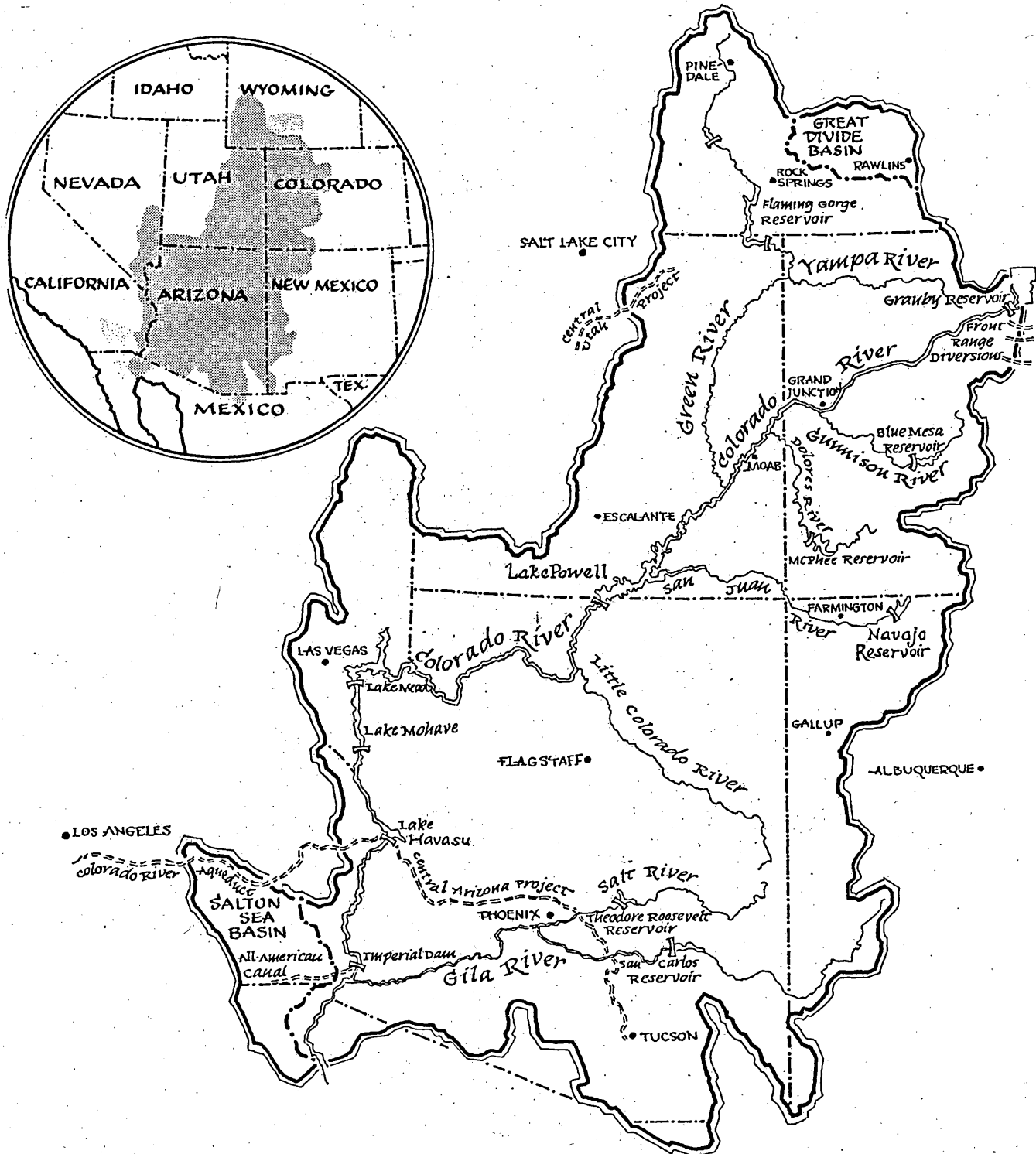
- v. Paria Canyon makes me feel like no other place can.

SA	A	N	D	SD
5	4	3	2	1

- x. It is great just being in the canyon country of the Paria Plateau.

SA	A	N	D	SD
5	4	3	2	1

13. On the map below, please draw a circle around any natural environments which are special to you --- spaces where you could go to have meaningful experiences, or places you value for their own sake. For example, a single small circle might indicate that only one small space holds unique personal meanings for you. On the other hand, you might feel that many parks or wilderness areas in a region are of equal value to you. In that case, you might draw a circle around all of canyon country or around a number of specific places. (Some four-corner cities and national parks of the Colorado Plateau are shown only as reference points.)



14. Please tell us how you felt about yourself while you were in Paria, or at any of the other special places you circled on the map.

a. How comfortable were you with yourself? That is, how much did you resemble the person you want to be?

EXACTLY LIKE WHO I WANT TO BE	ALMOST LIKE WHO I WANT TO BE	SOMEWHAT LIKE WHO I WANT TO BE	SELDOM COMFORTABLE WITH MYSELF	NOT AT ALL COMFORTABLE WITH MYSELF
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5	4	3	2	1
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b. Overall, how important is it to you to feel the way you feel in those special places you circled on the map?

EXTREMELY IMPORTANT	VERY IMPORTANT	MODERATELY IMPORTANT	SLIGHTLY IMPORTANT	NOT AT ALL IMPORTANT
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5	4	3	2	1
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15. Which of the following statements best describes your feelings about Paria Canyon? (Check the appropriate blanks)

___ a. Paria Canyon is nice to see once, but in the future I would prefer to explore different areas.

___ b. Paria Canyon is a great setting for hiking, camping, photography or sightseeing.

___ c. Paria Canyon is a great setting for group activities and experiences.

___ d. Paria Canyon is a good example of an environment I like to visit: the canyon country of the Colorado Plateau.

___ e. Paria Canyon is very special place and offers a totally unique experience.

PART THREE: YOUR PAST USE OF PARIA

16. Altogether, how many trips to Paria have you made during each of the following seasons?

___ spring trips

___ fall trips

___ summer trips

___ winter trips

17. How many years have passed since your first trip to Paria?
___ years since first visit
18. Have you changed or do you plan to change the days or seasons
of your visits to Paria? ___ yes ___ no

How will you change your visitation pattern?

Why?

PART FOUR: SOME INFORMATION ABOUT YOURSELF FOR CLASSIFICATION
PURPOSES ONLY (absolutely confidential)

19. How old were you on your last birthday? ___ years
20. What is your gender? ___ male ___ female
21. What is your home zip code? _____
22. Please circle the highest level of education you have
completed so far.
- 1 2 3 4 5 6 7 8 9 10 11 12 (high school)
13 14 15 16 (college)
17 18 (graduate school)
19+ (medical, law or other doctorate degree)

YOU HAVE COMPLETED THE QUESTIONNAIRE. THANKS FOR YOUR HELP!